

Analyte	CASN	Criteria (ug/L)	Source
4-Nitroaniline	100-01-6	966	l
4-Nitrophenol	100-02-7	532	e
Ethylbenzene	100-41-4	700	c
Styrene	100-42-5	1250	e
Benzyl alcohol	100-51-6	8.6	d
cis-1,3-Dichloropropene	10061-01-5	46.3	l
trans-1,3-Dichloropropene	10061-02-6	250	l
n-Propylbenzene	103-65-1	64	e
n-Butylbenzene	104-51-8	36	e
2,4-Dimethylphenol	105-67-9	105	e
m,p-Xylene	106-42-3	24000	r
p-Chlorotoluene	106-43-4	2120	l
1,4-Dichlorobenzene	106-46-7	75	c
4-Chloroaniline	106-47-8	2140	l
1,2-Dibromoethane	106-93-4	0.17	b
Acrolein	107-02-8	3	f
1,2-Dichloroethane	107-06-2	5	c
Acrylonitrile	107-13-1	1	b
Ethylene glycol	107-21-1	192	m
Vinyl acetate	108-05-4	16	e
4-Methyl-2-pentanone	108-10-1	26400	e
m,p-Xylene	108-38-3	24000	r
Bis(2-Chloroisopropyl)ether	108-60-1	200	f
1,3,5-Trimethylbenzene	108-67-8	71	e
Bromobenzene	108-86-1	4200	l
Toluene	108-88-3	1000	c
Chlorobenzene	108-90-7	64	d
Phenol	108-95-2	110	d
trans-1,4-Dichloro-2-butene	110-57-6	250	l
2-chloroethylvinylether	110-75-8	162,000	l
Pyridine	110-86-1	23	b
Bis(2-chloroethyl)ether	111-44-4	0.6	b
Bis(2-chloroethoxy)methane	111-91-1	12.3	l
Bis(2-ethylhexyl)phthalate	117-81-7	6	c
di-n-octyl phthalate	117-84-0	22	e
Hexachlorobenzene	118-74-1	0.00068	b
Anthracene	120-12-7	0.3	e
1,2,4-Trichlorobenzene	120-82-1	0.07	h
2,4-Dichlorophenol	120-83-2	10	f
2,4-Dinitrotoluene	121-14-2	0.49	f
1,2-Diphenylhydrazine	122-66-7	0.3	f
Dibromochloromethane	124-48-1	7.5	b
Tetrachloroethylene	127-18-4	5	c
Pyrene	129-00-0	7	e
Dimethyl phthalate	131-11-3	1,650	e
Cresol, M and O	1319-77-3	18,800	l

TCEQ Toxicology says to use the 10061-02-6 values for 110-57-6

added this comment

Added two new rows for m,p-Xylene so each CAS has it's own row

corrected spelling of ethylene

Added two new rows for m,p-Xylene so each CAS has it's own row
new entry

TCEQ Toxicology says to use the same values as 10061-02-06, copied here

added this highlight and comment

aka 1319-77-3MP, this is for total cresol

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Dibenzofuran	132-64-9	393	e
Xylenes, Total	1330-20-7	1340	e
sec-Butylbenzene	135-98-8	41	e
1,3-Dichloropropane	142-28-9	129	l
cis-1,2-Dichloroethylene	156-59-2	4180	l
trans-1,2-Dichloroethene	156-60-5	100	f
Methyl tert-butyl ether	1634-04-4	15	b
m,p-Xylene	179601-23-1	24000	r
Benzo(g,h,i)perylene	191-24-2	0.25	cc
Indeno(1,2,3-cd)pyrene	193-39-5	0.012	f
Benzo(b)fluoranthene	205-99-2	0.012	f
Fluoranthene	206-44-0	6.16	j
Benzo(k)fluoranthene	207-08-9	0.12	f
Acenaphthylene	208-96-8	3260	l
Chrysene	218-01-9	2.45	b
Benzo(a)pyrene	50-32-8	0.0025	b
2,4-Dinitrophenol	51-28-5	10	f
4,6-Dinitro-2-methylphenol	534-52-1	2	f
Dibenzo(a,h)anthracene	53-70-3	0.0012	f
cis-1,2-Dichloroethene (cis and trans)	540-59-0	14000	e
1,3-Dichlorobenzene	541-73-1	85	e
Carbon tetrachloride	56-23-5	4.5	b
1,1-Dichloropropene	563-58-6	62200	l
Benzo(a)anthracene	56-55-3	0.024	b
2-Hexanone	591-78-6	6130	e
2,2-Dichloropropane	594-20-7	163	l
4-Chloro-3-methylphenol	59-50-7	100	e
2,6-Dinitrotoluene	606-20-2	30	l
N-Nitrosodi-n-propylamine	621-64-7	0.05	f
Aniline	62-53-3	4690	l
n-Nitrosodimethylamine	62-75-9	0.0069	f
1,1,1,2-Tetrachloroethane	630-20-6	312	l
Benzoic Acid	65-85-0	900	e
Acetone	67-64-1	101200	e
Chloroform	67-66-3	70	c
Hexachloroethane	67-72-1	1.84	b
Benzene	71-43-2	5	c
1,1,1-Trichloroethane	71-55-6	200	c
Methyl bromide	74-83-9	100	b
Chloromethane	74-87-3	28000	e
Methyl iodide	74-88-4	870	l
Methylene bromide	74-95-3	4300	l
Bromochloromethane	74-97-5	26800	l
Chloroethane	75-00-3	175000	l
Vinyl chloride	75-01-4	0.23	b
Methylene chloride	75-09-2	5	c
Carbon disulfide	75-15-0	105	e

Bromoform	75-25-2	66.9	b
Bromodichloromethane	75-27-4	10.2	b
1,1-Dichloroethane	75-34-3	45800	l
1,1-Dichloroethene	75-35-4	7	c
Trichlorofluoromethane	75-69-4	871	e
Dichlorodifluoromethane	75-71-8	1963	e
1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	207	e
Hexachlorocyclopentadiene	77-47-4	0.7	e
Isophorone	78-59-1	340	f
1,2-Dichloropropane	78-87-5	5	c
Methyl ethyl ketone (2-Butanone)	78-93-3	13865	b
1,1,2-Trichloroethane	79-00-5	5	c
Trichloroethylene	79-01-6	5	c
1,1,2,2-Tetrachloroethane	79-34-5	1.64	b
Acenaphthene	83-32-9	23	i
Diethyl phthalate	84-66-2	600	f
Di-n-butyl phthalate	84-74-2	7	e
Phenanthrene	85-01-8	30	a
Butyl benzyl phthalate	85-68-7	1	f
N-Nitrosodiphenylamine	86-30-6	33	f
Fluorene	86-73-7	11	e
Carbazole	86-74-8	274	l
Hexachlorobutadiene	87-68-3	0.21	b
Pentachlorophenol	87-86-5	0.22	b
2,4,6-Trichlorophenol	88-06-2	13.5	e
2-Nitroaniline	88-74-4	136	l
2-Nitrophenol	88-75-5	959	e
Methylnaphthalene	90-12-0	2.1	d
Naphthalene	91-20-3	250	e
2-Methylnaphthalene	91-57-6	63	e
2-Chloronaphthalene	91-58-7	54	e
3,3'-Dichlorobenzidine	91-94-1	0.79	b
Benzidine	92-87-5	0.0015	b
o-Xylene	95-47-6	24000	r
2-Methylphenol	95-48-7	560	e
o-Chlorotoluene	95-49-8	2420	l
1,2-Dichlorobenzene	95-50-1	110	e
2-Chlorophenol	95-57-8	30	f
1,2,4-Trimethylbenzene	95-63-6	77	e
2,4,5-Trichlorophenol	95-95-4	64	a
1,2-Dibromo-3-chloropropane	96-12-8	11300	l
1,2,3-Trichloropropane	96-18-4	165	l
tert-Butylbenzene	98-06-6	48	e
Isopropylbenzene	98-82-8	255	e
Nitrobenzene	98-95-3	1100	e
3-Nitroaniline	99-09-2	177	l
p-Isopropyltoluene	99-87-6	42	e

aka "o-cresol"

a Texas Surface Water Quality Standards (30 TAC 307.6, Table 1) chronic freshwater aquatic life criterion. Effective March 1, 2018.

b Texas Surface Water Quality Standards (30 TAC Chapter 307.6, Table 2), water+fish criterion. Effective March 1, 2018.

c Based on Maximum Contaminant Levels (MCLs) specified in 30 TAC Chapter 290 (relating to Public Drinking Water) and referenced as so in the Texas Surface Water Quality Standard (30 TAC Chapter 307.6, Table 2). Applies to the "Water and Fish" value.

d TRRP Surface Freshwater Chronic Benchmark from Suter, G.W. II, and C.L. Tsao. 1996. *Toxicological benchmarks for screening potential contaminants of concern for effects on aquatic biota*. Revised. Oak Ridge, TN: Lockheed Martin Energy Systems, U.S. Department of Energy. ES/ER/TM-96/R2.

e TRRP Surface Freshwater Chronic Benchmark derived by TCEQ using the LC₅₀ approach in accordance with the Texas Surface Water Quality Standards 30 TAC 307.6(c)(7).

f TRRP Surface Freshwater Human Health Benchmark - National Recommended Water Quality Criterion. Available on-line at: <<http://water.epa.gov/scitech/swguidance/standards/criteria/health/>>. Accessed February 9, 2018. Carcinogens were adjusted to a 10⁻⁵ risk level.

g Value calculated using 15th percentile of segment hardness (46 mg/L) for Lake Houston (Segment 1002). Value located in Table D-10 of the *Procedures to Implement the Texas Surface Water Quality Standards* (RG-194). If site-specific data regarding hardness is given with the sample, that value should be used to calculate a site-specific value -see tab entitled "Aquatic Life Calc Spreadsheet" for equation.

h Based on Maximum Contaminant Levels (MCLs) specified in 30 TAC Chapter 290.

i TRRP Surface Freshwater Chronic Benchmark - Surface water value calculated by the EPA for use in the derivation of the sediment quality criteria. U.S. EPA. 1993. *Sediment quality criteria for the protection of benthic organisms—acenaphthene*. EPA-822-R-93-013. Washington.

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j TRRP Surface Freshwater
Chronic Benchmark - Surface
water value calculated by the
EPA for use in the derivation
of the sediment quality
criteria U.S. EPA. 1993.
*Sediment quality criteria for
the protection of benthic
organisms—fluoranthene.*
EPA-822-R-93-012.
Washington.

k TRRP Surface Freshwater
Chronic Benchmark -
Mancini, E.R., A. Steen, G.A.
Rausina, D.C.L. Wong, W.R.
Arnold, F.E. Gostomski, T.
Davies, J.R. Hockett, W.A.
Stubblefield, K.R. Drottar,
T.A. Springer, and P. Errico.
2002. MTBE Ambient Water
Quality Criteria
Development: A
Public/Private Partnership.
Env. Sci. and Tech. 36(2):
125-29.

l TRRP Tier 1 contact
recreation water PCL (tot RW
comb 2 column).

m TRRP Surface
Freshwater Chronic
Benchmark - Canadian
Council of Ministers of the
Environment. Canadian
water quality guidelines for
the protection of aquatic life.
Fact Sheets available on
derivation of individual
values.

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n “Phenolic” is not a specific chemical. The PCL is based on the most conservative phenol-containing chemical, pentachlorophenol, as a surrogate

o TRRP Tier 1 contact recreation water PCL (tot RW comb 2 column) - While some components of total petroleum hydrocarbons (TPH) may be analyzed and assessed individually (e.g., BTEX), for generic “oil and grease”, without additional information on aliphatic/aromatic and carbon range the most conservative approach would be to use the lowest TRRP contact recreation PCL for any aliphatic or aromatic carbon range, which is 28 mg/L for > 16-21 C aromatics and >21-35 C aromatics

p TRRP Surface Freshwater Chronic Benchmark - If the water body is used as drinking water for livestock, the freshwater chronic value becomes: cobalt 1 mg/L (NAS, 1974) , manganese 0.05 mg/L (Lewis, 1996; Higgins, 1998), molybdenum 0.3 mg/L (ANZECC, 2000) and uranium 0.2 mg/L (ANZECC, 2000). Use total-metals concentrations. These values are not hardness dependent. See supporting documentation for additional information and complete listing of sources.

q TRRP Tier 1 contact recreation water PCL (tot RW comb 2 column) - While there is no PCL for n-Octadecane, TCEQ Toxicology staff (March 29, 2019) recommend using the TRRP contact recreation PCL for of 28 mg/L for > 16-21 C aromatics

r TRRP Tier 1 contact recreation water PCL (tot RW comb 2 column) - contact recreation PCL for xylenes was used for m,p-xylenes and o-xylenes (March 25, 2019 TCEQ Toxicology staff)

s Single sample primary contact recreation 1 value from Texas Surface Water Quality Standards (30 TAC 307.7(b)(1)(A)(i)).

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t There no known PCL for carbonaceous biochemical oxygen demand; therefore, the permitted technology-based limit for treated process water of 39500 micrograms/L was used for comparison purposes.

u Tech based limit from TCEQ Permitting staff based on EPA and TCEQ permitting guidance

v TRRP Surface Freshwater Human Health Benchmark - 3- and 4-methylphenol are cresols, so the cresol freshwater "water+fish" REBEL used

w Analytical method for available cyanide should be used.

x Based on chronic aquatic life freshwater value for Chromium (hex) in Texas Surface Water Quality Standard (see 30 TAC Chapter 307.6 (c)(1), effective March 1, 2018). There is no standard for CAS 7440-47-3, so the most stringent standard for Chromium (hex) is used for comparison.

y Arochlors are mixtures of PCBs; therefore the PCB value for CASN 1136-36-3 was used. This is also the case for lab reported "total PCBs".

z Based on the procedure defined in TCEQ, 2010, *Procedures to Implement the Texas Surface Water Quality Standards*. The percentage of dissolved silver that is in the free ionic form is estimated from the following regression equation:

aa TRRP Surface Freshwater Chronic Benchmark - There is only an acute criterion (no chronic criterion). The indicated value is the acute criterion divided by 10.

bb Gamma and alpha chlordane are isomers of chlordane. Since there are no water quality standards or TRRP benchmarks for either isomer, it was given the same criteria as chlordane, which does appear in the TSWQS.

<p>cc TCEQ Toxicology Recommendation: Based on the benzo(a)pyrene value of 0.0025 ug/L and the relative potency factor of 0.01 for benzo(g,h,i)perylene, benzo(g,h,i)perylene would have a value of 0.25 ug/L.</p>	
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Analyte	CASN	Criteria (ug/L)	Source
C6-C12 Range Hydrocarbons	PHC612	NA	a
C12-C28 Range Hydrocarbons	PHCG1228	NA	a updated analyte name to be C12-28 rather than 38
C28-C35 Range Hydrocarbons	PHCG2835	NA	a
TPH	PHC635	NA	a
Total Organic Carbon		NA	b
4-Bromophenyl phenyl ether	101-55-3	NA	b
4-Chlorophenyl phenyl ether	7005-72-3	NA	b

a These constituents are covered in the "oil and grease" PCL - While some components of total petroleum hydrocarbons (TPH) may be analyzed and assessed individually (e.g., BTEX), for generic "oil and grease", without additional information on aliphatic/aromatic and carbon range the most conservative approach would be to use the lowest TRRP contact recreation PCL for any aliphatic or aromatic carbon range, which is 28 mg/L for > 16-21 C aromatics and >21-35 C aromatics

b This water quality parameter is not related to human health; therefore, it is not appropriate to develop human health comparison values to evaluate these parameters. There is no surface water comparison values and consequently will not be evaluated. This water quality parameter is not directly related to the incident, and the TCEQ is evaluating the chemicals that are directly related to the incident (benzene and toluene, for example)

2018 TSWQS Freshwater Aquatic Life Criteria Calculations

PWS- freshwater. AL= acute and chronic. HH = Public Water Supply +Sustainable Fish Tissue (

All answers in ug/L

All criteria for metals are **dissolved** - NOT total

WER Note: the water-effect ratio is always equal to one unless otherwise specified in Appendix E of the TSWQS (30 TAC,

Hardness = total hardness in mg/L as CaCO₃

Cadmium

Hardness =

WER =

Acute =

Chronic =

Chromium (Tri)

Hardness =

WER =

Acute =

Chronic =

Copper

Hardness =

WER =

Acute =

Chronic =

Lead

Hardness =

WER =

Acute =

Chronic =

Nickel

Hardness =

WER =

Acute =

Chronic =

column A in Table 2)

Chapter 307).

46
1

4.031366332
0.143323368

46
1

301.6430119
39.23755854

46
1

6.832727461
4.876618644

46
1

27.4701952
1.070474069

Lone Star Steel Lead (Appendix E)
Hardness =
WER =
Acute =
Chronic =

46
1

242.7491532
26.96193651

40.1
1

38.31507955
5.271123568

0.924152172

Pentachlorophenol

pH =

Acute =

Chronic =

Zinc

Hardness =

WER =

Acute =

Chronic =

7

8.723320878

6.692583681

46

1

60.68898688

61.18542031

Yes, the chronic is less stringent than the acute. This is (according to EPA) correct.

